GOUCHER | college

SYLLABUS – Methods & Data Structures

Course Number.....DA 520.001.16FA
Semester.....Fall 2016
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Welcome to our Course!

Data drives our world, and increasingly drives the art of the 21st century. This course will be a practical investigation of data as a material for art. This may include working image data, text, social media, and data of your choosing (such as economic, environmental, or societal data). We will learn methods for navigating data, transforming data, visualizing data, and come to understand it as a flexible material with significant creative potential.

During the course, we will use project-based learning to go in-depth into several programming techniques using the Python programming language. Homework will focus on the creation of a series of digital artworks guided by different topics and techniques. In the process, you will gain fluency with core programming concepts that can be applied to other fields such as web/app/software development, game design, tangible media, and creative code.

Main Course Topics

1. Text manipulation and text processing
2. Navigating data formats such as lists, dictionaries, JSON, and XML
3. Image processing using external python libraries
4. Communicating with web APIs
5. Visualizing data with external python libraryes or processing.py
6. Python syntax and class definitions
7. Basic command line use
8. Probabilistic programming and designing generative systems

Learning Objectives

At the conclusion of this course, you will be able to do the following:

1. Write custom programs to accomplish unique creative tasks
2. Find and visualize public data found on the web
3. Process image and text data
4. Understand the inner-workings of software, social media, and digital art tools
5. Modify open-source Python scripts to create derivative works or accomplish new tasks
6. Approach other Python frameworks (such as Django) with a sound understanding of Python
7. Program with good development strategies and workflow

Course Structure

This course will be broken up into three units: **methods**, **data**, and **processing**.

The **methods** unit will focus on text, poetry, and manipulation of words and sentences. The unit will culminate in creating a generative text artwork. (I am looking into integrating this with Twitter as part of the unit).

The **data** unit will focus on navigating common data types such as lists and dictionaries, and common data formats such as JSON and XML. For this unit, you will find a data source that interests you (such as world temperature by year since 1900) and generate a visual representation of the data.

The **processing** unit will focus on image data and image processing. The unit will involve learning to read/write image files, understand image data, and manipulate image data. The unit will culminate in each of you creating your own image filter (a la Instagram, although your filter will likely be wildly different).

Course Format

Course weekly workflow:

- Presentation of new material (Monday)
- Independent student work on weekly assignment or unit project
- Post completed assignment or progress (by Sunday)

Office Hours (WebEx)

- Starting in Week 2, I will hold weekly WebEx office hours for anyone who wants to ask questions or listen in. Attendance is optional and is not a requirement of the course, however this Q&A session may become an essential learning component for those of you who learn through conversation. As much as possible, I will record these office hours and post them online, however I cannot guarantee that all sessions will be recorded, so the best way to see them is to show up and participate!

Course Materials

This course will consist of a variety of media formats, including readings (PDFs and online articles), open-source templates/tutorials, video lectures, and discussions.

We will only occasionally use self-guided online tools (such as codecademy), however you are welcome to use them independently as a source of extra practice.

Assignments

Weekly Assignments
Some (not all) weeks will involve small weekly exercises to practice new techniques.

Projects

The bulk of the class work will revolve around three major projects. Currently, the following projects are planned for this class:

Unit 1: Twitter bot (text)
Unit 2: Data visualization
Unit 3: Custom image filter

However, these may change as the course progresses, depending on the pace and direction of the course. This section will be updated as each project assignment is finalized and distributed to the class.

Course Rules

1) All tech questions should be addressed to the class and posted to the discussion board. It is up to you, the class, the answer each other's questions. I will only occasionally chime in with answers.
2) You can use code from anywhere, but If your code is more than 50% borrowed, you must acknowledge where it came from and let me know what modifications are yours.
3) Students are encouraged to follow tangential aspects of the unit that interest them, even if these paths do not strictly fit the current assignment. If you have an idea for something you would like to study, contact me with your idea and we will find a way for you to do independent work and then present on the topic to the class.
4) Throughout the course, I will share links to programming news / relevant artworks that I find. I ask that you all do the same.
5) We will use a Google Community as our discussion board. Let's make it an informal, fun, and active space!

Required Readings

There is no required textbook for this class. We will use electronic resources.

PDFs
Python for Absolute Beginners by Dr. Martin Jones

Online resources
- codecademy.com
- stackoverflow.com
- github.com
- learnpythonthehardway.org/book/

Grading

Course Elements	Percent [or points]
Discussion and participation	10%
Weekly assignments	30%
Project 1	20%
Project 2	20%
Project 3	20%
TOTAL	100%

Grade Scale

A	93 or more points
A-	90 - 92 points
B+	87 - 89 points
B	83 - 86 points
B-	80 - 82 points
C+	77 - 79 points
C	73 - 76 points
C-	70 - 72 points
D	60 - 69 points
F	59 points and below

Course Policies

Communication:
Faculty will be available at their Goucher email address and will respond to queries within 48-72 hours. If you really need a quick answer, please call me on my cell at (805) 268-7464. I will call you back if I am not immediately available.

Course participants are responsible for maintaining continuous involvement with faculty, fellow students and student groups. In particular, participation in all online discussions is required. Ongoing communication allows you to gain deeper insights into the content, activities and assignments in the course. Please give notice of any obstacle that prevents this.

You are encouraged to ask questions whenever information needs clarifying.

- For questions pertaining to your assignments: send an email directly to the instructor (please do not post personal questions on the discussion board).
- For questions about assignments that may be interesting and helpful to other class members: please use the discussion board.
- For problems with technical aspects of the website: contact helpdesk@goucher.edu (you may copy the instructor).

Missed Work:
You are responsible for material covered in the course. It is your sole responsibility to obtain any materials missed.

Late Policy:
For proper graduate student learning to occur, pacing of content mastery is critical. Therefore, assignments are to be completed on time. If extreme circumstances prevent an assignment to be completed in a timely fashion, please notify me before the assignment is due so a new date can be negotiated. Only follow-ups completed by the due date can be redone. Late assignments without such notification will be docked.

Academic Integrity:
All final work products are to be the independent work of each student and stored in the electronic portfolio. Suspected violations of the Honor Code will be referred to the Academic Honor Board. For a full description of the code and what constitutes a violation of the code, refer to the Goucher Handbook or online at www.goucher.edu/x1292.xml.